KL UNIVERISTY, GUNTUR
FIRST SEMESTER 2010-11
Course Handout
Academic Division

Dated: 07-07-2010

Course No. : **BT C202**
Course Title : **Microbiology**
Course Structure : **3-0-3**
Course coordinator : **Mr K Sreenivasulu**
Instructors : **S. Prashanthi**

1. Course Description:
All classes of microbes are the fundamental tools for implementation of technological principles for development of different product useful for mankind. The aim of this paper to give in-depth knowledge on microorganisms, the handling principles and impact of these organisms on human society

2. Scope and Objective of the Course:
The course introduces and delineates various aspects of pure and applied microbiology. It mainly dwells upon the basic principles of Microorganisms, their isolation, preservation and sterilization and growth aspects. The course also focuses on taxanomical aspects of Microorganisms includes general characters, classification & medical Microbiology emphasis on disease characters, epidemiology and prevention

3. Books:

(i) Textbook:

1. Pelczar MJ, Chan ECS & Krieg NR, Microbiology Tata McGraw Hill.
2. Prescott & Dunn by **General Microbiology**- McGraw Hill publishers.

(ii) Reference Book:

1. C.B.Power. General Microbiology Vol I & II
2. Brock, **Biology of microorganisms** Prentice Hall Int.Inc.

4. Syllabus:

UNIT – I: History and classification of microorganisms
Discovery of microorganisms; Theory of spontaneous generation, Germ theory of disease; Microbial taxonomy and diversity: Bacteria and their broad classification - Major characteristics used in taxonomy. Major contributors in field of Microbiology - Antony van leeuwenhoeks; Louis Pasteur; Robert Koch; Edward Jenner; Joseph Lister; Winogradsky; Beijerinck. Physiology of Archaebacteria – thermophiles, psychrophiles, halophiles and methanogens.

UNIT-II: Morphology & cell structure of microorganisms
Ultra structure of bacteria, cell wall, flagella, pili, capsule, endospore and cell inclusions. Viruses – Chemistry & Morphology (size, shape and symmetry), replication of viruses, lytic and lysogenic cycles. Yeasts & Molds – Morphology, life cycle, economic importance of fungi (Eg. Aspergillus). Identification based on shape, staining reactions (Differential stain, Acid fast, capsule staining, Endospore staining).

UNIT – III: Growth kinetics of microorganisms

Bacterial nutrition- Nutritional classification of bacteria, Essential Macronutrients, Micronutrients and Growth factors. Microbial growth **–** Growth curve and factors affecting the growth – solutes, water activity, pH, Temperature, Oxygen concentration, Osmotic pressure, Radiation. Bacterial growth; synchronous growth and methods of growth estimation. Growth kinetics of viruses and fungus.

UNIT –IV: Growth media and control of microorganisms

Culture media - synthetic and complex media, solidifying agents, types of media. Isolation of pure cultures - spread, pour and streak plate methods; Maintenance and Preservation of microorganisms. Control of microorganisms – Sterilization and disinfection, effects of physical (moist and dry heat, radiation and filtration) and chemical agents. Antibiotics – classification, mode of action and resistance.

UNIT – V: Medical microbiology

Microbial pathogenesis–Disease reservoirs; Epidemiological terminologies; Infectious disease transmission; Respiratory infections caused by bacteria and viruses, Tuberculosis; Sexually transmitted disease including AIDS, Disease transmitted by animals (rabies and plague) and insects and ticks (rickettsias, lyme disease and malaria); Food and water-borne diseases; Public health and water quality, pathogenic fungi, emerging and resurgent infectious diseases., Prions.

5.Course Plan:

Lecture No	Learning Objectives	Topics to be Covered	Reference	Chapters
1.	Discovery of Microorganisms	A. Leeuwenhoek attempts	T2, P2	1
2.	Theory of Spontaneous Generation	Louis Pasteur, Redi experiments	T2, P6-8	1
3.	,,	Spllazani experiments	,,	1
4.	Germ Theory	Koch Experiment	T2, P7-8	1
5.	Taxonomy	Various classifications	T2, P429-435	19
6.	,,	Characters	,,	,,
7.	A. Leeuwenhoek	Contributions	T2, P1-2	1
8.	Louis Pasteur	Contributions	T2, P8-10	
9.	Robert Coach	Contributions	T2,P9-10	1
10.	Archae Bacteria	Physiology	T2, P451-462	20
11.	,,			3
12.	Ultra Structure of Bacteria	Cell wall structure	T2, P43-70	2
13.	,,	Organelles inside cell wall	,,	2
14.	,,	Outside Cell wall		2
15.	Replication of Viruses	Lytic Lysogenic	T2, P384-387	17
16.	Yeast, Molds	General Characters	T2, P554-560	25
17.	Economic Importance	Uses		

18.	Staining	Methods of Staining	T2, P27-30	2
19.	Nutrition classification	Classification based on C, Energy, Electron source	T2, P96-100	5
20.	Nutrients Classification	Macro, Micro Growth Factors	,,	,,
21.	Growth Curve	Lag, Log Stationary		
22.	,,	Death Phases	T2, P113-116	6
23.	Factors effect in growth	Temp, pH	T2, P121-130	6
24.	,,	Osmotic Pressure	,,	,,
25.	,,	Water Activity	,,	,,
26.	Growth estimation	Methods	T2, P117-120	6
27.	,,	,,	,,	,,
28.	,,	,,	,,	,,
29.	Growth kinetics of Fungus and Viruses	,,	,,	,,
30.	Media & types	,,	,,	,,
31.	Pure Culture isolation	Methods	T2, P105-107	5
32.	,,	,,	,,	,,
33.	Preservation	,,	,,	,,
34.	Sterlization	Methods	T2, P140-150	7
35.	,,	,,	,,	,,
36.	,,	,,	,,	,,
37.	Respirator Infections	Characters, prevention	T1, P815-818	8
38.	AIDS	,,	,,	,,
39.	Rabies, plaque	,,	T1,P897	8
40.	Malaria	,,	T1, P863-868	8
41.	Food and water borne diseases	,,	,,	8
42.	,,	,,	,,	8
43.	Pathogenic Fungi	,,	T1, P851-857	8
44.	,,	,,	,,	8
45.	Prions	,,	,,	8

6.Self learning material:

S.NO	Topic	Source	Counseling classes
1	Major characteristics used in taxonomy	**Internet**	
2	lytic and lysogenic cycles.		
3	Oxygen concentration, Osmotic pressure, Radiation		
4	Sterilization and disinfection		
5	emerging and resurgent infectious diseases		

7.Evaluation Scheme:

Component	Duration (minutes)	% Weightage	Marks	Date & Time	Venue
Test-1	50 Min	6	10	10-08-2010 9.30 to 10.20A.M	NSH
Test-2	50 Min	6	10	14-09-2010 9.30 to 10.20 A.M	NSH
Assignement submission		3	5	Continuous	NSH
Assignment Test	50 Min	3	5	26-10-2010 9.00 to 10.20 A.M	NSH
Quiz	30 Min	3	5	26-10-2010 9.00 to 10.20 A.M	NSH
Regular Lab Evaluation	Continuous	20	50		
Comprehensive Lab Exam	3 Hrs	16	40		
Comprehensive Exam	3 Hrs	36	60		
Attendance for Theory & Tutorial		3	5	Continuous	
Attendance for Lab		4	10	Continuous	

8. Chamber consultation hour: Informed in the class in first week.

9. Notices: All notices regarding the course will be put in E-learning website.

Course Coordinator